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ECONOMICS IN MCH

VOLUME 3

Costs of Family Health Services
Evaluation of Three Programs in New Jersey

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Abstract

Public sector agencies are increasingly asked to provide information on the costs of their services. Funding agencies requesting such information, however, are most interested in the "unit cost" of particular services, Estimating unit costs has been problematic for many public- sector providers, both because they lack the expertise to calculate these cost statistics and because the necessary service or fiscal data are unavailable.

This report represents an effort to develop a model for the estimation of unit costs and for the development of information systems that will facilitate their estimation. It is important to note, however, that there is no single "right" unit cost for any service. The cost estimate will vary depending on whether one is interested in knowing the cost borne by the client, provider, government, or society. For this reason, the goal of this document is to provide guidance and suggestions for estimating unit costs that can be adapted to any agency, although the estimates reported herein represent costs borne by society.

This report describes the total and unit costs of maternal and child health (MCH) services for three family health service agencies located in New Jersey. Four services were selected for this study: enhanced adolescent counseling; perinatal addiction treatment; case management; and early intervention. For each service, the report presents a description of the services provided, a discussion of the source and type of data used to estimate unit costs, an explanation of how the data were used to estimate unit costs, and a cost profile of the service.

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Volume 3:

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Evaluation of Three Programs in New Jersey

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I. Introduction

As a result of the push towards cost containment, public sector agencies are increasingly expected to provide information on the costs of their services. Funding agencies requesting such information, however, are most interested in the cost of particular services, such as case management, counseling, or medication management, or what is referred to as "unit" costs. Estimating unit costs has been problematic for most public sector providers in part because they lack the expertise for calculating cost statistics and in part because the necessary service or fiscal data are unavailable.

This report commissioned by the Maternal and Child Health Bureau (MCHB) of the U.S. Public Health Service and in cooperation with the New Jersey Department of Health and Senior Services (NJDHSS) represents an effort to develop guidelines for estimating unit costs and for developing information systems that will facilitate their estimation. It is important to note, however, that there is no single "right" unit cost. The cost estimate will vary depending on whether one is interested in knowing the cost borne by the client, provider, government, or society. For this reason, the goal of this document is to provide guidance and suggestions for estimating unit costs that can be adapted to any agency, although the estimates reported herein represent costs borne by society.

This report describes the total and unit costs of maternal and child health (MCH) services for three family health service agencies located in New Jersey. These services and programs were selected in collaboration with Celeste Andriot Wood, Acting Associate Commissioner of the New Jersey Department of Health and Senior Services (NJDHSS), Dorothy W. Angelini, Acting Director of MCH and Regional Services, and Cynthia K. Ewing, Acting Director of Special Child and Adult Health Services. After several discussions, four services were selected for study: enhanced adolescent counseling; perinatal addiction treatment; case management; and early intervention. These services were selected because (a) they were ranked as high priority services by the NJDHSS and MCHB; (b) they were provided by many large agencies located throughout the state; and (c) the services, as defined by the State of New Jersey, would be recognized by other states.

After selecting the services, the following representative sites were identified:

- Enhanced adolescent counseling services: *Planned Parenthood of Southern New Jersey* located in Camden, New Jersey.
- Perinatal addiction treatment services: *Paterson Counseling Center, Inc.* sited in Paterson, New Jersey.
- Case management and early intervention services: *Mercer County Special Child Health Services Case Management Unit* of Trenton, New Jersey.

Each site received a letter from one of the aforementioned NJDHSS officials inviting them to participate in the study. The sites were told that the NJDHSS was "receiving technical assistance, sponsored by the MCHB, to perform a cost analysis of select services for families in New Jersey." Dr. Wolff contacted key administrators at each of the program sites after they received the letters and made arrangements for a site visit. Drs. Wolff and Helminiak met with program officials to discuss the study and the types of data needed to complete the evaluation. Dr. Helminiak began working with the sites to assemble the necessary service use and cost data after critical issues regarding confidentiality and data acquisition were resolved.

Each of the following "cost" case studies begins with a description of the services and is followed by a cost profile. Because of the illustrative nature of these case studies, details are provided on the source and type of data, as well as on how the data were used to estimate unit costs. The reader may find it useful to consider the following questions while reading the case studies:

- Perspective. What is the cost perspective underpinning the estimate? Are the total and unit costs representing the costs borne by the client, provider, government, or society?
- Service definition. Are critical elements of the service described? Is it clear what the service is and does?
- Service information. What were the sources of service data? How was a service unit measured? Was this measure representative of the service

  activities? Were any relevant elements of the service omitted from the measure of the service unit? How were omissions accounted for in the calculation of unit costs?

- **Fiscal information.** What were the sources of fiscal data? What type of costs were included? Were any costs omitted? Was the omission appropriate given the perspective?

- **Interpretation.** What is the difference between unit costs based on unduplicated clients and unit costs based on total visits? Are the unit cost estimates reasonable?

II. Results

The results are presented under the following service headings: Section A: Enhanced Adolescent Counseling Services; Section B: Perinatal Addiction Treatment Services; and Section C: Case Management and Early Intervention Services. Each service section has four parts: Program/Service Description; Cost Profile: Service Profile; and Unit Cost Profile.

Section A: Enhanced Adolescent Counseling Services

Service use and cost data for enhanced adolescent counseling services were obtained from the Planned Parenthood of Southern New Jersey. The executive director of the program, Ms. Lynn Brown, met with Dr. Wolff on two occasions and with Dr. Helminiak on three occasions. During these meetings, discussions focused on data availability, acquisition, and interpretation, as well as survey development and issues of confidentiality. In addition, there were numerous telephone conversations between Drs. Wolff and Helminiak and Ms. Brown over the course of the evaluation.

1. Program/Service Description

Planned Parenthood of Southern New Jersey is a nonprofit health and education agency that serves roughly 5,000 clients during an average year. It offers comprehensive reproductive health services to all women regardless of age, marital status, or ability to pay. Reproductive health care at Planned Parenthood includes family planning services, pregnancy testing/counseling, prenatal care, and midlife services for women 35 and over. In addition, Planned Parenthood has two programs designed for teenagers. The Teens on Track program involves education, recreation, and reproductive health care services for teenage males (ages 13 through 18). The second

program, Peer Teen Center, is a peer counseling education program that uses both male and female teenagers in peer counseling.

Enhanced adolescent counseling services (EACS) are offered to clients who, according to their responses to a health behavior assessment form, are involved in risky behaviors (e.g., unprotected sex, drug abuse, smoking, incest, domestic abuse). All clients seen at Planned Parenthood are asked to complete a health behavior assessment form prior to seeing a Planned Parenthood provider. An interviewer reviews the *risks identified* by the client and documents the risks in the clinical record. During the visit, a Planned Parenthood staff member provides *appropriate risk-related counseling* and *information* to the client in an effort to reduce the risky behavior. Literature and audio visual aids for different types of risk are also made available to the client. Counselors at Planned Parenthood also help the client *develop skills in managing and resisting negative pressures* from peers and other sources of influence. As part of the enhanced counseling services, staff may *advise the client about behavior change*. Whenever possible, counselors *reinforce positive behaviors*. If a staff member cannot manage the identified risk, a *referral* is made to an outside provider or to another staff member within Planned Parenthood of Southern New Jersey (i.e., social worker, male counselor, peer teen). Referral follow up and educational reinforcement are provided at subsequent visits at Planned Parenthood.

2. Cost Profile

The cost numbers presented herein are based on calendar year 1997 (January 1, 1997 through December 31, 1997), which overlaps with the fiscal year for Planned Parenthood. Because Planned Parenthood of Southern New Jersey provides a menu of services (e.g., enhanced adolescent counseling services and other family planning services) at each visit, it was necessary to identify and parse costs on the basis of service type.

Cost data were obtained from two sources: (1) End-of-year fiscal reports, which provided information about salaries, fringe benefits, depreciation, insurance, operating supplies, and equipment costs and (2) Discussions with the executive director and the program accountant.

The objective of this analysis was to isolate the costs associated with enhanced adolescent counseling services from a societal perspective (i.e., costs borne by society). The process of identifying these costs, summarized in Table 1, is divided into four steps.

- Aggregate cost identification. According to the initial fiscal expenditure statement, the total fiscal costs associated with Planned Parenthood of Southern New Jersey for 1997 was $933,564. As shown in Table 1, the revenues to cover these costs were divided among grant funds (64 percent), program income (27 percent), and fund-raising (9 percent). These costs were used to cover the range of reproductive health services offered by Planned Parenthood of Southern New Jersey.

- Deducting non-relevant or misvalued costs. Three costs were deducted from the gross fiscal cost. First, Planned Parenthood administered a special grant for a violence prevention program, which was operated by another agency. This cost ($84,000) was treated as a pass-through cost since the services associated with this program were not provided by Planned Parenthood or to Planned Parenthood clients per se. Second, Planned Parenthood purchased equipment valued at $11,220 in 1997. Equipment by its very nature is durable. Including the full cost of equipment into the year it is purchased artificially inflates costs for that year. For this reason, the equipment costs for 1997 were deducted (although a portion of these costs will be added in the next step). And, third, although Planned Parenthood of Southern New Jersey operates at several satellite locations, the main building located in Camden is owned by Planned Parenthood. While no mortgage payment is included in the fiscal statement, capital costs of building depreciation are included in the statement (valued at $53,064). Since "opportunity" cost is a better indicator of the costs of capital invested in buildings (and equipment), building depreciation was deducted.

- Adding relevant costs. Two cost areas were added to the net fiscal cost estimate: the economic (or "opportunity") costs of the equipment and building owned by Planned Parenthood. The economic costs of building and equipment are estimated by the opportunity cost for capital assets. The main-site building located in Camden plus capital equipment were valued at $1,711,200. The estimated opportunity cost of the site plus equipment is $85,560.[1] It was also determined that space used by all of Planned Parenthood's satellite sites was donated and the fair-market value of the space, estimated at $9,000, was not included in the fiscal expenditure statement. Both of these costs were added to the total costs of the program.

[1]A five percent discount rate has been used to value capital as recommended by Gold, M.R., Siegel, J.E., Russell, L.B., and Weinstein, M.C. (1997). *Cost-Effectiveness in Health and Medicine.* New York: Oxford University Press.

- **Allocating costs to programs.** The economic value of all resources used by Planned Parenthood to provide comprehensive reproductive services in 1997 was estimated at $879,860. Identifying the proportion of these costs associated with producing enhanced adolescent counseling services was challenging because family planning services are provided by the same staff providing the enhanced adolescent counseling services and both of these services are provided during the same session. In addition, the agency's management information system did not separately record time spent delivering the different types of services. Consequently, it was necessary to conduct a survey of staff activities. The survey asked staff to report the amount of time spent providing enhanced adolescent counseling services and all other family planning services, as well as the amount of time spent on follow up activities related to each type of service. The survey form, developed in collaboration with Ms. Brown, Executive Director, and implemented under her direction, appears in Appendix A. The survey was completed by the entire clinical staff at Planned Parenthood during the last week of February. The survey was completed for 136 client visits and included 357 staff encounters. Using the survey data, it was determined that 18.1 percent of clinical staff time was devoted to enhanced adolescent counseling services. To determine the proportion of total program costs allocated to enhanced adolescent counseling services, total economic costs ($879,860) were multiplied by 0.181. Thus, the total economic cost of the package of enhanced adolescent counseling services provided by Planned Parenthood of Southern New Jersey in 1997 is estimated at $159,255.[2]

3. Service Profile

Data on total unduplicated clients and total number of client visits for 1997 were obtained from the management information system (MIS) of Planned Parenthood of Southern New Jersey. Service data for enhanced adolescent counseling services were obtained through a staff/client survey conducted during the last week in February. The survey forms appear in Appendix A.

According to the MIS, Planned Parenthood of Southern New Jersey provided services to 4,928 (unduplicated) clients in 1997. These clients were provided with 8,984 visits, or roughly 1.8 visits per client. According to the survey data, 49 of the 136 client visits included enhanced adolescent counseling services. If it is assumed that this ratio (0.3603) is representative of the annual ratios

[2]Using the ratio of costs for enhanced adolescent counseling services to all program costs, funding allocations for enhanced adolescent counseling services are as follows: $100,724 (63.2 percent) from grant funds; $43,139 (27.1 percent) from program income; $13,871 (8.7 percent) from fund raising; and $1,521 (1 percent) from donations. In terms of costs by category of spending, roughly 51 percent of spending for enhanced adolescent counseling services was for direct services (i.e., wages, salaries, and fringe benefits for clinical staff), an additional 39 percent of spending was allocated to operating services (i.e., administrative staff, supplies, and other non-capital costs), and 11 percent went to capital.

for both visits and unduplicated clients, then the proportion of all unit counts involving enhanced adolescent services are as follows: 1,776 unduplicated clients and 3,237 total visits.[3]

Table 1. Cost Profile for Enhanced Adolescent Counseling Services (1997)		
	Grant Funds	$596,145
	Program Income	255,323
	Fund-raising	82,096
Total Gross Fiscal Costs		**$933,564**
Deductions	Violence Prevention Program	$(84,000)
	Equipment	(11,200)
	Depreciation	(53,064)
Total Net Fiscal Costs		**$785,300**
Additions	Building and Equipment	$ 85,560
	Donated Space	9,000
Total Economic Costs		**$879,860**
Total EACS Costs	($879,860 x 0.181)	**$159,255**

4. Unit Cost Profile

Unit costs for enhanced adolescent counseling services (EACS) are calculated by dividing total economic costs for EACS by the total number of EACS service units (either unduplicated clients or total visits).

[3]Unduplicated counts were calculated by multiplying the total unduplicated counts for 1997 (4,928) by the ratio of visits including EACS to all client visits (0.3603). Similarly, the total visits estimate was calculated by multiplying the total visits in 1997 (8,984) by the adjustment ratio (0.3603).

Overall, based on the enumerated economic costs and service units, the estimated unit cost for enhanced adolescent services in 1997 is estimated at $89.67 per unduplicated client and $49.20 per visit.[4]

Section B: Perinatal Addiction Treatment Services

Data for the costing of perinatal addiction treatment services were provided by the Paterson Counseling Center, Inc.. Drs. Wolff and Helminiak met with Robert Alexander, Executive Director, and Tony McKean, Director of Clinical Services at the Paterson Clinic to discuss the purpose of the study and the data needed to complete the costing exercise. Subsequent to this meeting, they had several meetings with Joe Czechowski, Finance Director, to review service and cost data. In addition, Dr. Helminiak spent several hours at the Paterson Clinic reviewing records and cost data.

1. Program/Service Description

Paterson Counseling Center, Inc. is a multi-service health care agency. The Center offers a perinatal program, a methadone clinic, detoxification services, an HIV clinic, and primary care.

The Perinatal Addiction Treatment Center at Paterson Counseling Center, Inc. provides services to drug and alcohol addicted pregnant women. The program began in 1991 and has provided services to approximately 250 women since its inception. On average, the program serves 50 women per year. There are three staff dedicated to the Center: a full-time substance abuse counselor, a full-time coordinator, and a half-time nurse.

Perinatal addiction treatment services include the following core service components: prenatal/postpartum medical care; social services; nutritional counseling; outpatient addiction treatment; pediatric well-baby care; child care/babysitting services; parenting support services;

[4]The unit cost per unduplicated client was estimated by dividing $159,255 by 1,776 clients, whereas the unit cost per visit was estimated by dividing $159,255 by 3,237 visits.

HIV counseling/education; WIC services; and transportation. All perinatal clients are screened for medical high risk status.

2. Cost Profile

The cost profile for the Perinatal Treatment Center at Paterson Counseling Center, Inc. is based on calendar year 1997. This costing exercise includes the perinatal services, methadone treatment, and HIV services used by women enrolled in the Perinatal Addiction Treatment Center.

Cost data were obtained from end-of-year fiscal reports. Mr. Czechowski supplied cost data, in tabular form, for the perinatal addiction treatment services program. The data had already been disaggregated by type of cost (salary, insurance, supplies, etc). Drs. Wolff and Helminiak had numerous discussions with Mr. Czechowski about the meaning and inclusiveness of the fiscal entries.[5]

The costs for the Perinatal Addiction Treatment Center were derived from: (1) an expenditure table prepared by the Center's Finance Director. This table excluded costs associated with program administration, methadone program costs for perinatal clients, laboratory costs billed to Medicaid by outside laboratories, and HIV program costs of perinatal clients; (2) estimates of administrative costs calculated indirectly and with the assistance from the Finance Director; (3) estimates of methadone costs calculated according to an algorithm developed by the Finance Director; (4) estimates of laboratory costs billed to Medicaid by outside laboratories provided by the Finance Director; and (5) estimates of HIV costs for perinatal clients calculated according to service category rates obtained from the Finance Director.

[5]Original fiscal materials for this agency were not reviewed by the researchers. The Finance Director preferred to provide summary calculations instead. Thus, the cost estimates provided herein are based on the following procedure: (1) fiscal data requests were prepared by the researchers and provided to the Finance Director; (2) written responses were prepared by the Finance Director; (3) follow-up inquiries were made regarding the validity and applicability of the information; and (4) another set of written responses were provided by the Finance Director. Whether the estimates for the perinatal treatment services are comparable to those for the other two agencies is unknown since the researchers were unable to review the original fiscal materials or the techniques used for allocating costs among programs.

The study objective was to estimate the economic costs associated with the provision of perinatal addiction treatment services. Specific cost components appear in Table 2.

- Aggregate cost identification. Using the five data sources mentioned above, it was determined that the total cost associated with the Perinatal Treatment Center in 1997 is $321,022. The cost for the perinatal services identified by the Finance Director is $202,002. Estimates for administrative methadone costs[6], outside laboratory costs[7], and HIV treatment costs[8] were calculated separately.

- Deducting non-relevant or misvalued costs. The cost of equipment purchased by the program was not included in the cost data obtained from the Finance Director; hence, no deductions were necessary. Building space was included in program costs. Because the building is leased by Paterson Clinic at a competitive market rate, no adjustments in the value of the building space were necessary.

- Adding relevant costs. The opportunity cost of owned equipment (valued at $18,000 replacement cost) was estimated at $900.

- Allocating costs to programs. The total economic costs for the Perinatal Addiction Treatment Center of Paterson Counseling Center, Inc. in 1997 are estimated at $321,022.[9]

[6]Methadone costs were calculated as the total number of methadone days for women enrolled in the perinatal program during 1997 multiplied by the daily rate of $4.60 (number supplied by the Finance Director).

[7]The Finance Director estimated the cost of outside laboratory tests associated with the women enrolled the perinatal program.

[8]HIV-related costs were calculated as the number of HIV-related services by category multiplied by cost rates for each category. These values were provided by the Finance Director.

[9]Perinatal services are funded by a perinatal addiction grant from the State of New Jersey (59 percent) and Medicaid (41 percent). Methadone services are fully funded by a State of New Jersey substance abuse grant. HIV-related services are funded by Medicaid reimbursement and a Ryan White grant. The costs by category of spending for perinatal services only (exclusive of methadone, HIV-related services, and laboratory costs) are as follows: direct services comprised 67 percent of spending; operating services, 31 percent; and capital, 2 percent.

Table 2. Cost Profile for Perinatal Addiction Treatment Center (1997)		
Reported Perinatal Program Costs		**$202,002**
Administrative Costs		**12,521**
Methadone Treatment Costs		**48,424**
Outside Laboratory Costs		**48,000**
HIV-related Treatment Costs		**9,175**
Total Gross Fiscal Costs		**$320,122**
Deductions		**0**
Total Net Fiscal Costs		**$320,122**
Additions	**Equipment**	**900**
Total Economic Costs		**$321,022**

3. Service Profile

Four data sources were used to construct service profiles for the Perinatal Addiction Treatment Center. They are: (1) the management information system (MIS) of the Paterson Counseling Center, Inc. The MIS has utilization information about services provided by the Center and billed to Medicaid; (2) clinical records for Health-Start billed services; (3) the admit-discharge ledger for information on methadone services; and (4) the MIS for information about HIV-related services.

A total of 73 clients were enrolled in the Perinatal Addiction Treatment Center in 1997. These clients varied in their service profiles. Some clients received perinatal services, methadone treatment, and HIV-related services, whereas others received only perinatal services or methadone treatment.

- Perinatal services profile. Data from the agency's MIS and clinical charts were used to document the (a) number of unduplicated perinatal clients and (b) number

and type of service encounters. From the MIS, information was obtained on the number of Medicaid clients receiving perinatal addiction services in 1997; the number of separate service dates for these clients; and the number of individual services by type of service received by perinatal clients. Information on the number of non-Medicaid clients receiving Health-Start services were counted from clinical records. Overall, the Perinatal Addiction Treatment Center had 807 encounters[10] with 53 perinatal clients in 1997. That is, according to these enumerations, the average perinatal client received at least one service on 15 separate days in 1997.

- Methadone treatment profile. Methadone services were counted on the basis of one per day beginning from the date of admission to the date of discharge for all clients who were not drug-free. In a few instances, slightly shorter periods than the admit-to-discharge period were applied based on the advice of the perinatal program staff. In 1997, 63 perinatal clients had a total of 10,527 methadone encounters at Paterson Counseling Center.

- HIV-related treatment profile. Using the agency's MIS, HIV-related services were counted for number of services by service type, number of service dates, and number of clients. In 1997, four perinatal clients had 53 encounters with the Paterson Counseling Center.

4. Unit Cost Profile

Since many perinatal clients were either admitted to the Perinatal Addiction Treatment Center before January 1, 1997 or were discharged after December 31, 1997, focusing on 1997 discharge dates understates the mean cost per client for the overall period of enrollment. It is possible to provide rough approximations of the unit cost per client by comparing the average admit-to-discharge period for clients and the average number of months enrolled in the program for the 1997 period.

- Number of enrollment days for perinatal clients in 1997. The total number of days the 73 clients were enrolled in the perinatal program in 1997 was 10,527 for methadone clients (n=63) and 1,518 for drug-free clients (n=10). In total, the 73 clients were enrolled for 12,045 days in 1997, which translates into roughly 165 days of enrollment per perinatal client.

- Total number of enrollment days from admission to discharge. Enrollment periods were calculated for an episode of treatment for a sample of 32 perinatal clients who were discharged from the program in 1997. Some of these clients had

[10]An "encounter" is defined as a service date. The client may receive one or more services per encounter.

entered the program in 1997, others enrolled in 1995 or 1996. The 32 clients in this sample were enrolled for a total of 6,992 days, representing an average "episode" enrollment period per client of 218.5 days. The average "episode" enrollment period for clients receiving methadone treatment was roughly 15 days longer (233.4 days which was derived by dividing 6,068 days by 26 clients).

Assuming that 218.5 days per client roughly approximates the actual average "episode" enrollment period of perinatal clients, then the ratio between actual average "episode" and "annual" costs per client would be 1.32.[11]

The unit costs for the perinatal program are summarized in Table 3. Overall, for 1997, the average annual cost of perinatal, methadone, and HIV-related services per perinatal client is estimated at $4,398.

[11]Calculated by dividing the average enrollment period per episode (218.5) by the average enrollment period in 1997 (165).

Table 3.
Unit Cost Profiles for the Perinatal Addiction Treatment Center (1997)

Type of Calculation	Perinatal Services Only (Total costs =$263,423)		Methadone Treatment Only (Total costs = $48,425)		HIV-Related Treatment Only (Total costs = $9,175)		All Types of Treatment (Total costs = $321,022)	
	# of Units	Unit costs	# of Units	Unit Costs	# of Units	Unit Costs	# of Units	Unit Costs
Average annual cost per client receiving type of service in 1997	53 clients	$4,970	63 clients	$768.63	4 clients	$2,294	73 clients	$4,398
Average annual cost per enrolled client in 1997	73 clients	$3,609	73 clients	$663.34				
Average annual cost per encounter in 1997	807 encounters	$326.42	10,527 days	$4.60	53 encounters	$173.11		
Average episode cost per enrolled client	53 clients	$6,560[a]	233.4 days	$1,073.64[b]				

[a]Average episode costs were calculated dividing total costs ($263,423) by the number of clients (53) and multiplying the product by 1.32.

[b]Average episode costs were calculated by multiplying the average number of days of methadone treatment in an episode of care (233.4) by the cost per day of treatment ($4.60).

Section C: Case Management Services and Early Intervention Services

Information on services and program costs was supplied by the Mercer County Special Child Health Services Case Management Unit. Drs. Wolff and Helminiak met with Kris Deni, Director of Special Services and Barbara Mitchell, Program Coordinator in late November. At this meeting, a variety of procedural and research issues were discussed and a protocol was developed for exchanging information. Dr. Helminiak met with Ms. Mitchell on three occasions to construct service profiles for clients served in 1997. In addition, because problems arose in the downloading of information from the management information system, a software consultant was hired to assist Ms. Mitchell in constructing service utilization profiles. These on-site meetings with Dr. Helminiak and the consultant were supplemented by numerous telephone calls.

1. Program/Service Description

The Mercer County Special Child Health Services Case Management Unit, established in 1982, is one of 21 county units located throughout the State of New Jersey. The unit is funded jointly by the New Jersey State Department of Health and Senior Services and the Mercer County Board of Chosen Freeholders. The Case Management Units provide family centered, community-based, coordinated and comprehensive services for children birth to 21 years of age who have birth defects, chronic health problems, developmental delays, or conditions that may interfere with normal growth and development. The Mercer County program has an active caseload of roughly 880 clients. The unit offers two types of services: case management and early intervention services coordination.

Case Management/Care Coordination services include activities carried out by a case manager to assist special needs children and their families. Case managers make home visits, consult by telephone, provide initial counseling, offer support to families, and advocate for children who need special services. Emphasis is placed on developing on-going plans that address children's medical, educational, social, and economic needs.

Early Intervention Services Coordination is designed to address a problem or delay in development and provide family support as early as possible. Case managers assist and enable children eligible for Part H (now Part C) Early Intervention Services and their families to receive the rights, procedural safeguards, and services that are authorized to be provided under New Jersey's Early Intervention Program. Family directed services are available for infants and toddlers up to age three. Following an evaluation and assessment, an individualized treatment plan is developed that describes the services appropriate for the child's needs. The individualized plans may include one or a combination of the following services: assessment, assistive technology, audiology services, family training and counseling, health services, medical services, nursing services, nutrition, occupational therapy, physical therapy, psychological services, social work services, speech/language pathology, transportation, and vision services.

2. Cost Profile

Fiscal information provided by the Mercer County Special Child Health Services (MCSCHS) Case Management Unit was used to construct the cost profile for calendar year 1997. Because the fiscal year for MCSCH begins on July 1, cost profiles were constructed using data for two fiscal years (July 1, 1996 to June 30, 1997 and July 1, 1997 to June 30, 1998).

Cost data were drawn from separate end-of-year fiscal reports for the case management and early intervention programs. Additional information was provided by the Director of Special Services and the Program Coordinator.

The goal of the costing exercise was to estimate the economic costs associated with case management and early intervention services. Table 4 summarizes the cost components for the each type of service.

- Aggregate cost identification. According to relevant fiscal statements, the total cost associated with the services provided by the MCSCHS unit in 1997 is $542.871, with roughly 45 percent of these costs expended on case management services. Funding for case management services was obtained from a state grant (62 percent), a Mercer County grant (30 percent), Mercer County subsidy (8 percent), and program income/Medicaid (1 percent). A grant from the federal government funded the early intervention services.

- Deducting non-relevant or misvalued costs. The MCSCHS unit moved to a new building owned by Mercer County in March of 1997. Until March 1997, both types of services received donated building space, valued at $18,000, from Mercer County. The value of the rent subsidy was identified as an in-kind contribution on the expenditure statement for the final quarter of fiscal year 1997 (April-June 1997), though the subsidy was fully attributed to the case management program.

  The new location also offered the use of a meeting room. Although the space is generally available to the MCSCHS staff, it was not included in the rental payment. Ms. Mitchell reported that the meeting room was rarely used by MCSCHS staff. As a result, the value of the space was not included as an in-kind contribution.

  In addition, the expenditure statement had several anomalous entries for actual rent payments (equaling $1,800), which may actually have been non-recurring moving expenses. This cost appeared on the expenditure statement of the case management program.

  Moving the MCSCHS unit to a new location within the year being costed introduced costs that were independent of the program's true operating costs. For this reason, the explicit rent subsidy (for the previous location) charged to the expenditure statement and other anomalous costs were subtracted. To simplify matters, rent for the entire year was calculated according to the new rental arrangements (which reflect recurring costs). The net subtractions include the $18,000 subsidy for the old space and an $1,800 rent payment -- both charged to the case management program. The additions for space cost at the new location are discussed in more detail in the next section.

- Adding relevant costs. The MCSCHS unit benefits from the part-time assistance of a high school work-study student who performs clerical tasks. The student's time is considered a donation; hence, no payment is accrued. The student contributed an estimated 497 hours of work in 1997. The value of the contributed time, assuming $5 per hour, is $2,485.

  In addition, administrative services are donated by the Director of Special Services. The value of time (estimated at 10 percent) donated by the director does not appear in the expenditure statement for MCSCHS. Based on the director's salary and fringe benefits, contributed time was estimated at $11,594.

  The program supervisor suggested that pension costs were lower than normal during part of 1997. No documentation was available to explore this issue. Consequently, pension costs were not adjusted.

  The market value of the newly acquired building space is $17,500. Mercer County, the owner of the property, charges the MCSCHS unit $500 per month, or $6,000 per year, to rent the space. Implicitly, the MCSCHS unit receives an annual subsidy of $11,500 from Mercer County. Because all itemized costs related

to building space were deducted in the preceding step, the expected rental payment per year ($6,000)[12] plus the implicit rental subsidy ($11,500) were added to the overall cost of the program.

- Allocating costs to programs. The economic value of the resources used by Mercer County Special Child Health Services to provide case management and early intervention services in 1997 is estimated at $550,150. Because each service was provided by a separate program and each program receives targeted funding (and has a separate expenditure statement), explicit costs could be easily allocated along service lines.[13] The allocation of costs associated with donated resources was determined in collaboration with the program coordinator. Using the informed opinion of Ms. Mitchell, 75 percent of the costs of donated resources ($25,579) were apportioned to early intervention services, and the remaining portion was assigned to case management services. Overall, the total economic cost of case management services is estimated at $229,580 (42 percent), compared to $320,570 (58 percent) for early intervention services.

[12]The early intervention portion of the rental payment ($4,500) was included in the gross fiscal costs for the program ($301,385); hence, to avoid double counting, only the portion attributed to the case management program ($1,500) was itemized under "additions."

[13]There may be some cross-subsidization between the two programs. Ms. Mitchell, Program Coordinator, thought that some funding for case management might be supporting the program providing early intervention services. While it would have been useful to measure the extent of the cross subsidy between programs, this type of detailed analysis was not possible in a brief study such as this. It is, however, believed that the cross-subsidy, if it exists, is not large enough to compromise the quality of the unit cost estimates for each service.

Table 4. Cost Profile for Mercer County Special Child Health Services (1997)				
		Total	**Case Management**	**Early Intervention**
	Federal grant	$301,385[a]		$301,385[a]
	State grant	151,915		
	Mercer County grant	73,071	$ 73,071	
	Mercer County subsidy	15,300	15,300	
	Program Income/Medicaid	1,200	1,200	
Total Gross Fiscal Costs		**$542,871**	**$241,486**	**$301,385**
Deductions	Space allocation	($ 18,000)	($18,000)	($ 0)
	Rent payment	(1,800)	(1,800)	(0)
Total Net Fiscal Costs		**$523,071**	**$221,686**	**$301,385**
Additions	Work study student	$ 2,485	$ 1,864	$ 621
	Administrative subsidy	11,594	8,696	2,899
	Rent subsidy	11,500	8,625	2,875
	Expected rental payment	4,500[b]	4,500	0
Total Economic Costs		**$553,150**	**$245,371**	**$307,780**

[a] Includes the portion of the rent ($1,500) paid by the early intervention program.
[b] The portion of rent assessed to the early intervention program ($1,500) is included in gross fiscal costs.

3. Service Profiles

The management information system (MIS) of the Mercer County Special Child Health Services Unit was used to construct service utilization profiles for 1997. From the MIS, information was compiled on the number of (1) unduplicated clients by service type; (2) total contacts by service type; and (3) total contact time by service type. Service utilization data archived by the MCSCHS unit are organized into three-month (quarterly) data files. The quarters corresponded with the

calendar year: first quarter (January 1, 1997 through March 31, 1997), second quarter (April 1, 1997 through June 30, 1997), third quarter (July 1, 1997 through September 30, 1997), and fourth quarter (October 1, 1997 through December 31, 1997).

Retrieving information from the MIS was troublesome in part because the system was new (implemented in early 1997) and staff were unfamiliar with the software and in part because the entries were organized by client name, not unique identifier. Many of the software problems were resolved through technical assistance. However, the most vexing and lasting problem was the organization of the data system by client name. Critical to the costing exercise is enumerating unduplicated clients. Unduplicated counts are typically calculated by identifying all unique clients (by unique identifier) and then counting the number of unique entries in the data system. But, because MCSCHS clients are not assigned unique identifiers, individuals are identified by name differentiation. This would not be problematic if client names were accurately entered into the MIS with each new encounter. However, after inspecting the data, it was discovered that the names of some clients had been entered with various alternative spellings. Computer programs designed to count unique clients recognize each different spelling of a person's name as a different person, resulting in an over-enumeration of MCSCHS clients.

Ms. Mitchell spent many hours cleaning the data to remove alternative spellings within each data file, which are organized by three-month intervals. Although all misspellings were eliminated within a quarter, they persisted across the four quarters comprising calendar year 1997. Since the MCSCHS Unit could not spare the resources to correct the cross-quarter misspellings, an adjustment ratio was constructed to control for the bias. The adjustment ratio was constructed by selecting ten names at random from each of the four "cleaned" data files. Ms. Mitchell then checked these 40 names against all the names appearing in the files for the full year. Through the cross-checking process, 48 different names were found for the 40 unique persons identified in the four quarter data files. The corresponding adjustment ratio of 0.833 (40/48) was applied to the whole-year total (duplicated) counts of names to obtain an estimate of unduplicated clients for 1997.

Another problem with the MIS was uneven data entry. Further inspection of the data revealed curious quarterly patterns; service counts were unusually low in the first quarter and unusually high in the second quarter (reflecting a special effort to enroll additional clients).[14] The most accurate representation of service volume is probably the third quarter of 1997.

Table 5 shows the service profiles for case management and early intervention services by quarter and for 1997. The majority of contacts for both types of services involved telephone calls; 95 percent of all case management contacts were telephone contacts, compared to 91 percent for early intervention services.

Table 5.
Service Profiles for Case Management Services and Early Intervention Services (1997)

Time Period	Total Contacts[a]	Total Hours of Contact[b]	Unduplicated Clients
Case Management Service			
First Quarter, 1997	521	178.25	192
Second Quarter	1,101	582.00	548
Third Quarter	827	33.50	346
Fourth Quarter	1,050	453.75	507
Full Year, 1997	3,499	1,587.50	1,2226 [1,022][c]
Early Intervention Service			
First Quarter, 1997	2,018	806.50	277
Second Quarter	2,648	1,310.30	434
Third Quarter	2,414	1,272.25	343
Fourth Quarter	2,591	1,448.25	416
Full Year, 1997	9,671	4,837.30	911 [759][c]

[a] Contacts include telephone calls to the client, home visits, and office visits.
[b] Total hours of contact include time spent with clients and follow-up activities.
[c] Numbers in brackets show unduplicated counts after applying the adjustment ratio of 0.833.

[14] Unique events may have contributed to a low services count during the first quarter. In particular, the programs moved to a new site during February causing some disruption in the provision of services around the time of the move. Also, a new computer program for counting services was installed about the same time, introducing possible reporting errors. During the second quarter (which was the end of the fiscal year), remaining funds were used to employ additional professional staff time, thereby raising the service hours in that period.

4. Unit Cost Profiles

Unit costs were calculated using three different service use measures (unduplicated client, contact, and contact time) and adjusting for the suspected non-representative counts of the first quarter[15]. The unit cost estimates are presented in Table 6. Overall, for 1997, the average annual cost of case management services per client is estimated at $224.64. The comparable estimate for early intervention services coordination is $422.36.

Table 6.
Unit Cost Profiles for Case Management Services and Early Intervention Services (1997)

Type of Calculation	Case Management Service ($245,371)		Early Intervention Service ($307,780)	
	Unit Measure	Unit Cost	Unit Measure	Unit Cost
Cost per 1997 unduplicated client	1,022	$240.09	759	$405.51
Cost per 1997 contact, unadjusted	3,499	$ 70.12	9,671	$ 31.83
Cost per 1997 contact, adjusted	3,805	$ 64.49	10,607	$ 30.57
Cost per 1997 contact hour, unadjusted	1,589	$154.56	4,837	$ 63.63
Cost per 1997 contact hour, adjusted	1,782	$137.64	5,303	$ 58.04

III. Summary and Recommendations

Estimating total and unit costs is straightforward provided that the agency has the requisite service use and fiscal data and knows how to use the available data to estimate the cost borne by a particular reference group (e.g., client, provider, insurer, government, society). The case studies described in this report highlight particular problems (e.g., overlapping service definitions, missing

[15]Because the services counts for the first quarter of 1997 are suspected of being non-representative of resources activity, third quarter volume measures for contacts and contact hours were used to proxy the true service activity for the first quarter.

or unreliable service use data, omitted or inappropriately included resource costs) that may arise when estimating units costs. Indeed, it is rare when such problems do not arise. Thus, one should approach costing exercises with the expectation that there will be problems with the data. The challenge is how to manage the problems so that reliable and meaningful total and unit costs can be estimated. As shown in this report, sometimes the appropriate solution involves conducting a special service utilization survey, other times the solution may involve reviewing service use patterns and estimating the expected volume of services. It is impossible to predict in advance what problems will arise; however, problems can be detected if a systematic and critical approach is assumed when compiling and reviewing the data.

The following approach is recommended:

- Choice of Perspective. Define the study perspective at the beginning of the study. In this report, all costs, both explicit costs borne by the agency and implicit costs associated with donated resources, were included in the calculation of total economic costs. Costs were defined broadly because the societal perspective was assumed. If, however, the narrower perspective of the provider had been chosen, implicit costs would have been excluded because these costs were not borne by the agency.

- Timing of the study. Indicate the period of study (calendar year, fiscal year). Because the objective is to connect resource costs with service use, it is essential that service use data relate to the same period of time as the cost data. It is generally easier if a fiscal year time period is used.

- Define the service unit. Define the service unit in terms of key elements that relate to service activities and resource use. Examine in detail who is providing the services, what the services seek to do, and where the services are performed.

- Choose a service data source. Identify the most reliable data source for measuring service use. Evaluate data sources carefully. Look for what is measured in the data base and what is omitted. Review the documentation for the data source; compare how the data source measures the unit of service to the service unit definition described above. Are elements of the service unit missing? Review quarterly trends in the service data. Is there evidence of uneven data recording? Does the service use data make sense? Is the range of clients and service units consistent with the agency's sense of its activity level?

- Assemble the fiscal data. Prepare a ledger that shows all relevant revenue sources. Identify funds allocated to rent and capital equipment. Determine whether there are any rent subsidies or other donated resources from other agencies. Calculate the market value for all donated resources. Allocate costs among programs and services. Are costs allocated so that only those costs associated with resources used by the program/service are assigned to that program/service? Are costs measured in a way that is consistent with the study perspective? the definition of the service unit? Are any relevant costs omitted or irrelevant costs included?

- Calculate unit costs. Provide unit cost estimates for unduplicated clients and visits. Do these estimates seem reasonable? Estimates are likely to be higher when a societal perspective is assumed (the numerator -- costs -- are larger) and if service units are underreported (the denominator -- service units-- are smaller). For these reasons, caution must be used when interpreting the size of unit cost estimates. These estimates are likely to be unstable if the reporting or recording of service units changes over time.

The approach recommended above is generalizable to any agency or provider, although the specific rates resulting from this approach are typically not generalizable. Unit cost estimates are highly sensitive to the way in which service activity is measured. If providers only record billable services in their management information system, then the unit cost estimates will be biased upwards because all other service activities have been excluded from the enumeration of services in the denominator. Likewise, unit costs will overstate "true" costs if service data are entered erratically or inconsistently into the management information system. The service data contained within management information systems are vitally important in the calculation of unit costs. Agencies are well advised to measure their service activities comprehensively, to make sure that their services data are entered accurately and completely into the MIS, and to document the data archived in their MIS. There is really no point in calculating unit costs if the service data are unreliable and uninterpretable.

Appendix A: Daily Logs

Daily Log for the Study of the

Planned Parenthood of Southern New Jersey

Client Record Number: _____ Date of Service: _____

We are interested in knowing how much of your time with clients is spent on ***enhanced adolescent services***. The daily log table below asks that for **each visit with a client** that you (1) divide your **total visit time** (in minutes) with clients into two categories: **time spent on enhanced adolescent** services (column A) and **all other family planning** (column B). The amount of time spent on these two activities would equal the total amount of time spent with the client (Column C, which is the sum of columns A and B).

Provider Information		Record Number of ***Minutes*** Spent in the Visit on the following:		Total Visit Time (A + B)
Provider Name	Provider-type[1]	Enhanced Adolescent Services (A)	All Other Family Planning (B)	
		Minutes	Minutes	Minutes

[1]**Provider-type codes: 1=counselor; 2=nurse; 3=nurse practitioner; 4=other**

Daily Log for the Study of the

Planned Parenthood of Southern New Jersey

Staff Name: _____ Date of Service: _____

We are interested in knowing how much of your time with clients is spent on ***enhanced adolescent services***. The daily log table below asks that for each visit with a client that you record how much time (in minutes) you spend outside the visit on follow-up activities, such as follow up phone calls or paperwork based on the visit. All your **follow-up activities** related to client visits are recorded in Columns D and E. Your **time outside of the session on follow-up activities related to *enhanced adolescent services*** are recorded in Column D and all other follow-up activities are recorded in Column E. All follow-up time related to the visit is recorded in Column F (which should equal the sum of Columns D and E).

Client Number	Record Number of ***Minutes*** Spent ***Outside*** the Visit on the following:		Total Number of ***Minutes*** on **Follow-up** Activities (D + E)
	Follow-up to Enhanced Adolescent Services (D)	**Follow-up** to Other Family Planning (E)	
	Minutes	Minutes	Minutes